Transportation Synthesis Report

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Aesthetic Considerations for Context-Sensitive Design

Prepared for
Bureau of Highway Operations
Division of Transportation Infrastructure Development

Prepared by
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Transportation Synthesis Reports (TSRs) are brief summaries of currently available information on topics of interest to WisDOT technical staff in highway development, construction and operations. Online and print sources include NCHRP and other TRB programs, AASHTO, the research and practices of other state DOTs, and related academic and industry research.

REQUEST FOR REPORT

Landscape designers in the Bureau of Highway Operations are interested in seeing how other states and national agencies are approaching the issue of aesthetics in the design of transportation facilities that meet community needs. The RD&T Program was asked to compile current information on this topic.

SUMMARY

A review of available research and Web sites relating to aesthetics in the field of context-sensitive design revealed only a few detailed guidelines, principally two recent studies from the Texas DOT, summarized below. Two NCHRP reports are referenced, one complete and one underway, along with related Web sites and information about TRB Committee A2A05 on Landscape and Environmental Design.

COMPLETED RESEARCH

Guidelines for Aesthetic Design in Highway Corridors: Tools and Treatments for Texas Highways
The report is available as a PDF file at the following link for $8.95: http://www.ntis.gov/search/product.asp?ABBR=PB2002105408&starDB=GRAHIST. RD&T has obtained the file and provided it along with this report.

This study was completed in September 2001 by the Texas Transportation Institute. The goals of the project were to determine what resources currently exist for planning aesthetic treatments for transportation projects and to provide guidelines and assistance for planning in the future. Below are the highlights of this study:

- A **literature review** of current practices within state DOTs concerning aesthetics yielded little in the way of guidance on how to use specific treatments or elements or on how to assess and evaluate proposed aesthetic improvements. The literature suggested that aesthetic treatments on highways may have an impact on driver performance, though the research team found no studies showing the effect of a particular treatment.

- The team conducted a **survey of 15 state DOTs** to determine what agency resources related to aesthetics are available online. They consulted by phone landscape architects, design engineers, and bridge engineers in each of the states to find out what specific treatments they're using and what kind of response they are getting to the improvements.

- The report includes a **pilot survey of the traveling public** to determine which aesthetic treatments are preferred. Though the data is inconclusive for a variety of reasons (such as drivers reacting more to the architecture and landscaping outside of the right-of-way than to the roadway), results do indicate that if aesthetic elements are included within a roadway, those who use the corridor will likely notice them.

- The researchers outline **a methodology for understanding and gauging the effects** of proposed aesthetic enhancements on driver performance, which is based on conceptual approaches to human visual perception from the fields of Environmental Psychology and Human Factors Research. Their model provides a framework for identifying specific design objectives within a selected site that are based on the type and quality of visual information occurring or needing to occur.

- The study includes **a set of aesthetic guidelines** designed to provide straightforward approaches to deciding what is and is not appropriate in a given situation. The authors discuss how designers can evaluate a situation based on its effect on the transportation function, specifically driver performance and safety, while creating a pleasurable experience for the user and a positive contribution to the visual character of the community. The report includes specific technical data on 25 aesthetic treatments or elements under the following categories: poured-in-place concrete, modular concrete, veneers, paving traffic barriers, asphalt, pedestrian barriers, lighting, site amenities, and public art.

Texas Department of Transportation Landscape and Aesthetic Design Manual
PDF version available at http://manuals.dot.state.tx.us/docs/coldesig/forms/lad.pdf

This comprehensive manual provides in-depth information and guidance on landscape and aesthetic design in the field of transportation. It includes details about selecting and using specific aesthetic treatments, as well as design planning and evaluation. Below is a brief overview of each of the five chapters included in the guide:

Chapter 1: Introduction to Landscape and Aesthetic Design
The transportation system is a network of highways, trails, railroads, airports, transmission lines, pipelines, canals, and waterways set in the landscape. The goal of the transportation designer is to fit the highway or other facility into the adjacent landscape in a way that is complementary to, and enhances, the existing landscape. Achieving this goal requires consideration of natural, ecological, aesthetic, economic, and social influences related to that landscape. This chapter includes sections on the following topics: Landscape and Aesthetics Design of Transportation Infrastructure, Responsibilities of Landscape Architects, Aesthetics of Transportation System Elements, Context Sensitive Transportation Design, Policy and Authorities Impacting Landscape and Aesthetics Design.

Chapter 2: Assessment, Planning, and Design
The overall planning process for landscape and aesthetic design employs a variety of tools and techniques to guide the process. This chapter reviews three of these elements essential to the planning process:

Section 1 explains a Landscape and Aesthetics Assessment (LAA), which identifies issues associated with a specific project. The LAA provides planners with a means of estimating development costs and gathering information that will assist in determining choices appropriate to the specific project. The assessment results in a statement useful in both recording and communicating project issues and recommendations.

Section 2 discusses a Landscape and Aesthetics Plan (LAP), which builds on the LAA to coordinate project decisions, control project complexity, estimate costs, and ensure sustainability. The final LAP contains palettes that provide guidance on materials, colors, finishes, signage and fixtures, and structural choices.

Section 3 provides recommendations and guidelines for developing a Landscape Design, which determines and records specific landscape and aesthetic approaches and choices for a project.

Chapter 3: Project Development Process
This chapter provides specific steps to be taken in the landscape and aesthetic design of the project, including preliminary design and environmental design.

Chapter 4: Landscape and Aesthetics Guideline for Common Structural Elements
This chapter provides recommendations and guidelines for landscape and design considerations of common structural design elements of transportation facilities such as bridges, retaining walls, surface finishes, landscape design, signals and signs, and many more.

Chapter 5: Landscape and Aesthetics Guideline for Transportation System Features
This chapter suggests recommendations and guidelines for landscape and design considerations of common transportation features like interchanges, highway corridors, entrance and exit ramps, and more.

NCHRP REPORTS

NCHRP Report 480: A Guide to Best Practices for Achieving Context Sensitive Solutions
This recently published report provides a concise, easily readable guide that state DOTs and other transportation agencies can use to incorporate context-sensitive design principles into their transportation project development work. The guide demonstrates how state departments of transportation and other transportation agencies can incorporate context sensitivity into their transportation project development work. Example project documents are included on the accompanying CD-ROM (CRP-CD-23). Both BHO and BHD have this report. RD&T has ordered additional copies for district use.

Design Guidelines for Safe and Aesthetic Roadside Treatments in Urban Areas
http://www4.trb.org/trb/crp.nsf/All+Projects/NCHRP+16-04
This NCHRP project is in contract negotiation for fiscal year 2003. The objectives of this project are to develop (1) design guidelines for safe and aesthetic roadside treatments in urban areas and (2) a toolbox of effective roadside treatments that (a) balance pedestrian, bicyclist, and motorist safety and mobility and (b) accommodate community values. The guidelines will be based on an evaluation of the effects of treatments such as trees, landscaping, and other roadside features on vehicle speed and overall safety. The guidelines will generally focus on arterial and collector-type facilities in urban areas with speed limits between 25-50 mph.

INFORMATIVE WEB SITES

FHWA Context Sensitive Design Site
http://www.fhwa.dot.gov/csd/
The Federal Highway Administration and the American Association of State Highway and Transportation Officials, with the help of several other organizations, maintain an extensive Web site entitled Context Sensitive Design/Thinking Beyond the Pavement. It provides an overview of context-sensitive design, information about what leading state DOTs are doing to embrace context-sensitive design, and links to upcoming conferences and events in this field.

National Transportation Enhancements Clearinghouse
http://www.enhancements.org/
Transportation Enhancements are community-focused activities related to surface transportation that involve consideration of environmental, cultural, economic, and social conditions. This site provides an explanation of the Transportation Enhancements program (a federal-aid reimbursement program) and how it is implemented at the state level. The National Transportation Enhancements Clearinghouse (NTEC) is an information service sponsored by the Federal Highway Administration and the Rails-to-Trails Conservancy. It provides professionals, policy makers and citizens with timely and accurate information necessary to make well-informed decisions about transportation enhancements, including landscaping and scenic beautification.

The site includes a compilation of Web sites, virtual libraries, databases and other Internet resources that provide information on contacts, reports, legislation, policies, implementation or other issues relating to activities that can be funded as Transportation Enhancements.

OTHER RESOURCES

TRB Committee A2A05 on Landscape and Environmental Design
http://gulliver.trb.org/directory/comm_detail.asp?c=A2A05
This committee is concerned with the design parameters that relate to the protection, conservation, restoration and enhancement of the natural environment and man-made elements of transportation systems and their surroundings. A historical review of the committee's 70 years of activities has been published by TRB. See http://199.79.179.82/sundev/detail.cfm?ANNUMBER=00933789&STARTROW=1&CFID=98748&CFTOKEN=91924963
Committee chair: Harlow C. Landphair at h-landphair@tamu.edu. TRB Staff Representative: Stephen Maher at smaher@nas.edu.

Visualization: Guidance for the Project Engineer
http://www.hsrc.unc.edu/research/visual.html
Engineers, architects, designers, and planners are relying more and more on the use of visual simulations and computer-generated models as a means of improving their ability to communicate more effectively with the general public and with their colleagues. This online guide, published by the University of North Carolina Highway Research Center, provides an overview of visualization capabilities and techniques, a discussion of cost benefits and development time, and a survey of the state-of-practice of state DOT visualization techniques.